



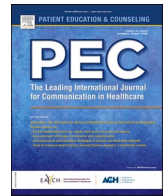
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Sense of security during COVID-19 isolation improved with better health literacy – A cross-sectional study

Brynja Ingadottir^{a,b,*}, Bjork Bragadottir^c, Sigridur Zoëga^{a,b}, Katrin Blondal^{a,b}, Helga Jonsdottir^{a,b}, Elin J.G. Hafsteinsdottir^b^a University of Iceland, Faculty of Nursing and Midwifery, Eiríksgrata 34, 105 Reykjavík, Iceland^b Landspítali - University Hospital of Iceland, Skaftahlid 24, 105 Reykjavík, Iceland^c Primary Care of the Capital Area, Alfabakka 16, 109 Reykjavík, Iceland

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ABSTRACT

Objective: To assess sense of security, health literacy, and the association between sense of security and health literacy during COVID-19 self-isolation.**Methods:** In this cross-sectional survey all adults who caught COVID-19 from the onset of the pandemic until June 2020 in Iceland and received surveillance from a special COVID-19 outpatient clinic, were eligible. Participants retrospectively answered the Sense of Security in Care – Patients' Evaluation and the European Health Literacy Survey Questionnaire. Data were analysed with parametric and non-parametric tests.**Results:** Participants' (N = 937, 57% female, median age 49 (IQR=23)) sense of security during isolation was Med 5.5 (IQR=1) and 90% had sufficient health literacy. The proposed regression model ($R^2 = .132$) indicated that those with sufficient health literacy had, on average, higher sense of security than those with inadequate health literacy.**Conclusion:** Sense of security was high among individuals who received surveillance from an outpatient clinic during isolation and was associated with health literacy. The high health literacy rate may be an indication of a high COVID-19 specific health literacy rather than general health literacy.**Practice Implications:** Healthcare professionals can improve the sense of security of patients through measures to improve their health literacy, including their navigation health literacy, by practising good communication, and providing effective patient education.

1. Introduction

The onset of the COVID-19 pandemic put a great responsibility on the government and healthcare officials to support all dimensions of human security under threat i.e., health, food, economic, environmental, personal, community and political security [1] and thus create as much sense of security in the society as was possible. When diagnosed with COVID-19, infected people had to self-isolate, initially for at least 14 days, sometimes on their own. At the beginning of the pandemic, uncertainty prevailed regarding the disease progress, symptoms and final outcomes. Studies on mental well-being during isolation are gradually emerging and show that post-traumatic stress disorder may be a consequence [2] and that many factors can predict stress during isolation, such as being female, single, and having higher education status [3]. Stigma and depression have also been reported during

isolation and quarantine [2,4]. Providing people with a sense of security during isolation was therefore imperative to avoid panic, ensure compliance with instructions delivered by health authorities and minimise avoidable healthcare visits and admissions.

The sense of security concept is related to terms such as safety, dependability, and certainty [5]. It is a basic human need [6] and is particularly visible in situations when life or health is threatened [7]. Liberska [7] defines sense of security as the 'effect of a subjective impression of an individual concerning the fulfilment of their need for security' (p. 146). There is limited research on this concept but within palliative care, sense of security is associated with the availability and quality of care [8,9] and self-efficacy [9], while lower feelings of security are associated with higher symptom intensity, lower health-related quality of life, more stress and less support from others [9]. Within maternity care, parents' sense of security is associated with the

* Correspondence to: University of Iceland, Faculty of Nursing and Midwifery, Eiríksgrata 34, 101 Reykjavík, Iceland.

E-mail address: brynjain@hi.is (B. Ingadottir).<https://doi.org/10.1016/j.pec.2023.107788>

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empowering behaviour of the attending midwife/nurse, a sense of general well-being and affinity within the family [10]. The COVID-19 pandemic has negatively affected people's sense of security in daily life, including their health [11]. It is possible that part of this effect on sense of security is caused and influenced by the huge media coverage (information overload) that has been ongoing, and which has put people's health literacy to the test.

Health literacy is a developing concept, and a recent conceptual model contains 12 dimensions referring to the knowledge, motivation, and competencies of accessing, understanding, appraising, and applying health-related information within the healthcare, disease prevention and health promotion settings, respectively [12]. Increased health literacy is important in order to improve public health through individuals becoming more responsible for their own health [12–14]. Health literacy is associated with health-related outcomes, health behaviours, healthcare use and expenditure, and interventions to improve health literacy are being developed and tested [15–19]. Patients with limited health literacy have difficulties with self-management, especially adherence, communication and knowledge [20].

The importance of health literacy in the COVID-19 pandemic is well recognised; it is a tool that allows one to take part in health communication, make sense of the situation, make health-related decisions, and adhere to COVID-19 policies and recommendations [21], and consequently it has helped with tackling the pandemic. The establishment of the COVID-HL network, an open science and research community, with the participation of more than 100 researchers from over 50 countries, is a further confirmation of the relevance of health literacy in the pandemic [21]. There are many different ways of measuring health literacy, but it is important to closely link how health literacy is understood and measured [22] in order to be able to develop effective interventions. Currently, specific instruments to measure health literacy in a pandemic are lacking [23] but among the most recent and general instruments available is the European Health Literacy Survey Questionnaire [24], which was developed by the European Health Literacy Project (HLS-EU) and used to conduct the first comparative European health literacy survey [25].

In Iceland, a country with a population of 360,000, the pandemic hit the nation early (end of February 2020) with the first cases among a group of people travelling from Italy and Austria. At the onset of the pandemic, health authorities and the national university hospital organised telephone surveillance and support services for all individuals with COVID-19 during their self-isolation. At the time of diagnosis, each person was contacted by this COVID-19 outpatient-clinic, checked on regularly and provided with an access to an emergency number if symptoms worsened. The organisation of healthcare in Iceland during COVID-19 and illness severity of recovering patients has previously been described [26–28].

Self-care is required by the person with COVID-19 during isolation, in many ways similar to the self-care of the chronically ill [29]. This includes maintaining health through sufficient sleep, nutrition, fluid intake, and mobility; monitoring, and managing symptoms, and knowing what to do if symptoms worsen. From the COVID-19 outpatient clinic the infected people in isolation received comprehensive care: both patient education and counselling on how to manage symptoms, assessment of their physical and mental state, emotional support to handle the stress of being isolated and having a new and unknown disease, and referral to on-site urgent clinic or other services as appropriate [26,27,30].

The national TV station, and other main media outlets, broadcasted a daily press conference from the very beginning of the pandemic, where health care authorities and the Department of Civil Protection and Emergency Management gave an update on the situation and gave instructions and advice on what the public were expected to do and how to behave to avoid catastrophe. Other media followed with thorough coverage of the situation.

Although modern technology facilitates socialising with others and

provides continuous access to information via the media, during isolation we hypothesise that isolation can negatively affect sense of security in infected people, especially those with other health problems. Furthermore, we suggest that health literacy and sense of security are associated, although it is not clear how. Sufficient health literacy may help people to make sense of health-related information and distinguish between false information (fake news) and evidence-based information. People with insufficient health literacy may have more problems with understanding and applying the provided recommendations of health-care providers which they receive through the media or in direct communication. However, it is also possible that people with sufficient health literacy have more difficulties during their isolation as they may better understand the potential lethality of the disease and its impact on daily life.

Therefore, the aim of this study was to assess the self-reported sense of security among individuals with COVID-19 during their isolation, their health literacy, and the possible association between sense of security and health literacy.

2. Methods

2.1. Design

This was a cross-sectional survey study. Data were collected with questionnaires and from medical records 3–4 months after the participants were diagnosed with COVID-19.

2.2. Participants and setting

Those eligible for participation were all adults (18 + years old) in Iceland who had a confirmed diagnosis of COVID-19 with a polymerase chain reaction (PCR) test, from early March until June 15th, 2020, were not staying in a hospital or a nursing home at the time of diagnosis, and received surveillance from the COVID-19 outpatient clinic run by Landspítali – the National University Hospital of Iceland.

2.3. Data collection procedure

Eligible persons were sent an information letter, questionnaires and a pre-stamped envelope, by mail. They could either answer the questionnaires on paper and return them by mail or answer online with the Research Electronic Data Capture (RedCap) tools hosted at the University of Iceland [31]. A short text message was sent out as a reminder 10 days after the survey was sent out, and again two weeks later.

2.4. Measures

2.4.1. Sense of security

Sense of security was assessed with the Sense of Security in Care – Patients' Evaluation (SEC_P) questionnaire which consists of 15 items with six response options (never=1, seldom=2, sometimes=3, often=4, very often=5, always=6). The overall score was calculated by averaging the response scores over the 15 items, with possible scores ranging from 1 to 6, higher scores indicating more sense of security. Three subscales were also calculated, for care interaction, identity, and mastery. The instrument was validated in its original form among a group of patients in palliative home care with satisfactory results [32]. The Icelandic version was previously used among patients with heart failure and internal consistency (Cronbach's alpha) in that study was .90 [33] and .88 in this study.

2.4.2. Health literacy

Health literacy was assessed with the European Health Literacy Survey (HLS-EU-Q16) which contains 16 questions about difficulties with accessing, understanding, appraising and applying information to tasks related to decision-making in healthcare, health promotion and

disease prevention [34]. There were four response options for each item (very difficult, fairly difficult, fairly easy, very easy). The answers were dichotomised when scoring the questionnaire. Very and fairly “difficult” were scored as zero (0) and very and fairly “easy” were scored as one (1). By summing up the scores for the questions the overall score for each respondent could take on a value between 0 and 16. The overall score indicated the respondent’s level of health literacy defined as: Inadequate (0–8), Problematic (9–12) and Sufficient (13–16) health literacy [34, 35]. In accordance with Gustafsdottir et al. [35] missing responses were scored as zero provided that no more than two responses were missing. The Icelandic version was validated among an elderly population where its psychometric properties were assessed as satisfactory [35].

2.4.3. Health status

Patients rated their perceived health with the modified EQ-VAS, a visual, vertical analogue scale associated with the EQ-5D-5 L instrument [36]. The endpoints were labelled with ‘The worst health you can imagine’ (=0) and ‘The best health you can imagine’ (=100). With permission from the EuroQol Group [37] the instrument was modified, and patients were asked to indicate their overall health as they recalled it to have been before they were diagnosed with COVID-19.

2.4.4. Risk category

Healthcare professionals who made the first contact with the person diagnosed with COVID-19 categorised them into one of three risk categories based on their age and whether they had any of the following comorbidities that had been identified as potentially associated with more severe COVID-19 illness: diabetes, cardiovascular disease, hypertension, chronic pulmonary disease, chronic kidney disease; cancer (in active treatment or remission) and inflammatory diseases. Assessed as at *low risk* were patients < 50 years of age without a known risk factor, at *medium risk* were patients ≥ 50 years without a risk factor or < 50 with a risk factor, and at *high risk* were patients ≥ 50 years with a risk factor or ≥ 70 years without a risk factor. This data was retrieved from patients’ medical records.

2.4.5. Background information

Background information regarding education, marital status and number of persons in the household was obtained from the participants. Data on age, gender, and date of positive PCR, were retrieved from the patients’ medical record. The number of days from diagnosis was calculated as the difference between the date of diagnosis and the return date of the survey.

2.5. Statistical analysis

Data was analysed using Stata 13.1 statistical package (StataCorp, College Station, Texas USA). Median (Med), interquartile range (IQR), minimum (min) and maximum (max) were reported for non-normal interval variables as well as for ordinal variables, and frequency (n) and percentages (%) for categorical variables.

A Shapiro-Wilk test was applied to test for normal distribution of interval variables (age, days from diagnosis). The main outcome variable, sense of security, was an ordinal variable measured on a Likert scale, therefore non-parametric methods were used for measures of association between sense of security and other variables and for testing of hypotheses, Spearman’s (rho) rank correlation coefficient was calculated to assess the association between sense of security and age, health literacy score, health status before COVID-19, number of persons in the household and days from diagnosis. A Kruskal-Wallis test was applied to test the hypothesis that there would be a different sense of security between groups (gender, marital status, education and risk group). The level of significance was set at .05 (two-sided) for all tests.

Multivariate regression was performed to gain further understanding of the relationship between sense of security and health literacy while controlling for participant characteristics found to be significantly

associated with sense of security. Residuals were assessed for normal distribution and homoskedasticity with Shapiro-Wilk and Breusch-Pagan tests, respectively.

2.6. Ethical approval

The study conforms to the principles outlined in the Declaration of Helsinki [38] and received approval from the Institutional Review Board (14–2021) and the Scientific Research Committee of the hospital (Ref. 16). Participants received an information letter with the invitation to participate and were informed that returning a filled-out questionnaire would be regarded as consent to participate.

3. Results

3.1. Characteristics of the participants

Of 1554 eligible participants in the study, 937 (60%) responded, 51.3% (n = 481) responded on paper and 48.7% (n = 456) responded online.

The median value for age was 49 (IQR=23; min=18; max=92; n = 937), 57.4% were women, 77.3% were married or cohabiting. Health status before COVID-19 had a median value of 90 (IQR=11; min=10; max=100; n = 932), and the median value for days from COVID-19 diagnosis was 133 (IQR=22; min= 65; max=221; n = 924). A Shapiro-Wilk test of normal distribution rejected normality of the variables age (p < .001) and days from diagnoses (p < .001). See Table 1 for a further description of the participants’ characteristics.

3.2. Sense of security

The participants’ perceived sense of security had a median value of 5.5 (IQR=1; min=1.7; max=6; n = 822), was highest in care interaction (median=5.7; IQR=1.0; min=1.5; max=6.0) but lower for identity (median 5.3; IQR=1.3; min=1.5; max=6.0) and mastery (median=5.3; IQR=1.7; min=1.3; max=6.0). The least sense of security was reported for items concerning how often participants found they could do what

Table 1
Characteristics of the participants.

Characteristics	n (%)
Age groups	
18–29	147 (15.7)
30–39	133 (14.2)
40–49	215 (23.0)
50–59	210 (22.4)
60–69	180 (19.2)
70 +	52 (5.5)
Marital status	
Married or cohabiting	716 (77.3)
Single	133 (14.4)
Divorced	36 (3.9)
Widowed	18 (1.9)
Other	23 (2.5)
Education	
Primary school	125 (13.5)
Vocational	213 (23.0)
Matriculation	147 (15.9)
University	440 (47.6)
Number in household	
One	86 (9.3)
Two	256 (27.7)
Three	163 (17.6)
Four	229 (24.7)
Five or more	192 (20.7)
Risk group	
Low risk	406 (44.1)
Medium risk	291 (31.6)
High risk	223 (24.2)

was most important to them (median=4; IQR=3; min=1; max=6) and how often they felt in control of their situation (median=5; IQR=2; min=1; max=6).

Spearman's rank correlation calculations demonstrated a positive and significant association between sense of security, and health literacy score ($\rho=.31$; $p < .001$), health status before COVID-19 ($\rho=.23$; $p < .001$) and age ($\rho=.11$; $p = .002$). There was a weak negative relationship between sense of security and number in household ($\rho=-.09$; $p = .011$) and a significant difference in sense of security by the different educational levels ($p = .014$), risk groups ($p = .003$). See Table 2 for further results regarding participants' perceived sense of security by different health literacy levels and characteristics.

3.3. Health literacy

The median score for health literacy was 16 (IQR=1; min=1;

Table 2

The relationship between sense of security and participant characteristics.

	n	Mean (SD)	Median	IQR	Min	Max	p-value ¹
Health literacy level							< .001
Inadequate	18	4.2 (0.93)	4.4	1.2	2.5	5.8	
Problematic	61	4.8 (0.79)	4.9	0.9	2.7	6.0	
Sufficient	731	5.3 (0.75)	5.5	0.9	1.7	6.0	
Gender							.593
Male	348	5.2 (0.78)	5.5	0.9	2.2	6.0	
Female	474	5.2 (0.79)	5.5	1.0	1.7	6.0	
Marital status							.624
Married/cohabiting	630	5.2 (0.76)	5.5	0.9	1.7	6.0	
Single	122	5.2 (0.84)	5.4	1.0	2.2	6.0	
Divorced	31	5.1 (0.80)	5.3	0.9	2.9	6.0	
Widowed	14	5.2 (0.87)	5.3	0.9	3.1	6.0	
Other	21	5.1 (0.98)	5.5	1.3	2.5	6.0	
Number in household							.002
One	79	5.2 (0.73)	5.3	0.9	2.9	6.0	
Two	226	5.3 (0.74)	5.6	0.9	1.7	6.0	
Three	145	5.3 (0.72)	5.6	0.7	2.8	6.0	
Four	199	5.1 (0.83)	5.3	0.9	2.1	6.0	
Five or more	168	5.1 (0.82)	5.3	1.1	2.5	6.0	
Education							.014
Primary school	106	5.2 (0.90)	5.5	1.1	1.7	6.0	
Vocational	186	5.3 (0.73)	5.5	0.9	2.4	6.0	
Matriculation	132	5.3 (0.77)	5.5	0.9	2.7	6.0	
University degree	393	5.2 (0.78)	5.4	1.0	2.1	6.0	
Risk group							.003
Low risk	367	5.1 (0.81)	5.4	1.0	2.2	6.0	
Medium risk	255	5.3 (0.68)	5.5	0.9	2.9	6.0	
High risk	185	5.3 (0.77)	5.6	0.9	1.7	6.0	

Footnote: 1 Kruskal-Wallis, two-tailed test.

max=16; n = 904) with 90% (n = 811) of participants classified as having sufficient health literacy, 8% (n = 72) problematic and 2% (n = 21) inadequate health literacy. The association between health literacy score and health status before COVID-19 was found to be weakly positive and significant ($\rho=.16$; $p < .001$), but health literacy was not associated with age ($p = .721$) or number of persons in the household ($p = .152$). Women had a higher health literacy score than men ($p = .001$), and health literacy was different between risk groups ($p = .036$) and participants' educational levels ($p = .048$) but not their marital status ($p = .100$).

3.4. Multiple regression analysis

Although the overall sense of security was not found to be associated with gender, males were found to have a higher sense of security on the mastery sub-scale compared to females ($p = .005$). Therefore, gender was also included as a control variable. Robust standard errors were applied due to non-normal and non-homoscedastic residuals. Table 3 presents the results for the regression of sense of security on health literacy while controlling for characteristics which were found to be significantly related to sense of security.

The regression analysis indicated a gradual increase in the average sense of security with increasing level of health literacy, other things being equal. Compared to those categorised as having inadequate health literacy, the average sense of security for those with problematic health literacy was estimated to be 0.6 points ($p = .021$) higher and almost 1.1 points ($p < .001$) higher for those with sufficient health literacy, after controlling for age, gender, number in household, education, risk group and health status before COVID-19. Education was significantly related to sense of security, with the average sense of security estimated to be higher for individuals with vocational education ($b=.13$; $p = .038$) and matriculation ($b=.17$; $p = .030$) compared to those with university education.

4. Discussion and conclusion

4.1. Discussion

This study provides new knowledge about the well-being of people during isolation because of COVID-19, and also about sense of security as an important, emerging concept and outcome of healthcare services.

Table 3

Results from the regression analysis.

Dependent variable Sense of security (n = 789)	b	95% CI	p
Health literacy (base category Inadequate HL)			
Problematic HL	.600	.092 1.109	.021
Sufficient HL	1.065	.596 1.534	< .001
Age	.003	-.003 .008	.386
Gender (base category Male)			
Female	-.004	-.115 .106	.940
Number in household (base category One)			
Two	-.035	-.225 .155	.720
Three	.007	-.196 .210	.946
Four	-.144	-.347 .059	.164
Five or more	-.177	-.384 .030	.094
Level of education (base category University)			
Primary school	.085	-.104 .275	.378
Vocational	.133	.007 .259	.038
Matriculation	.174	.017 .331	.030
Risk group (base category Low)			
Medium	.129	-.023 .282	.096
High	.125	-.108 .357	.294
Health status before COVID-19	.012	.007 .018	< .001
Constant	2.949	2.126 3.773	< .001
R ²	.132		
Adjusted R ²	.116		

The relationship found between sense of security and health literacy adds to the growing evidence of how health literacy can impact the health and well-being of people.

Sense of security was high in this population during isolation for COVID-19, which was interesting as the experience of being in isolation was probably new and foreign to most people and uncertainty around the whole situation may have been expected to reduce sense of security. Illness uncertainty is characterised by ambiguity, vagueness, unpredictability, unfamiliarity, inconsistency, and lack of information about the diagnosis or severity of the illness [39,40]. All this was relevant for the person with COVID-19 in the first wave of the pandemic.

The explanation for the overall high sense of security among participants, in spite of the uncertainty surrounding their situation, may lie in their good access to healthcare through the surveillance provided by the COVID-19 outpatient clinic. Care interaction had the highest score within sense of security in this study, indicating that provided care was substantially contributing to sense of security. Another explanation for the high sense of security in this group may be that in the beginning large, socially connected groups were infected. Examples are groups of work colleagues, including healthcare professionals, and members of the same sports clubs and choirs. Despite their physical isolation, they may have created, through online communication and social media, norms of support, inclusion and trust which could have led to greater sense of security, which is an essential component of feeling socially connected [41].

Sense of security is an underdeveloped concept and there are few studies with which to compare our results. Research on sense of security during COVID-19 is emerging from educational perspective [42] and theory, such as the self-determination theory has been used to explain the psychological impact of the pandemic on students [43]. The Basic Psychological Needs Theory (BPNT) within the self-determination theory has been used for years as a framework to understand how human beings satisfy their basic psychological needs and that their psychological well-being and optimal functioning is predicated on autonomy, competence and relatedness [44] all of which is relevant for fulfilling the need for sense of security. Within healthcare, the concept sense of security is of interest, not only in relation to the COVID-19 pandemic but also with the increasing burden of chronic illness globally and demands on patients to do self-care which can be both complex and hard work [45]. Previous research on sense of security within the context of palliative care and pregnancy, childbirth and the postnatal period indicates that both the self-determination theory as well as Bandura's self-efficacy theory [46] can be helpful in developing the concept as having control, self-efficacy, competence, support and sense of affinity within the family are ongoing themes in patients' descriptions of their sense of security [5,9,10,47,48].

As with sense of security, health literacy was also very high in this population, with 90% of participants having sufficient health literacy. This is an unusual result within health literacy research, even when taking into account the age and education of the population. The only available data on health literacy in the country was collected with the same instrument and comes from older populations but indicates that 50–72% of people have sufficient health literacy [35,49].

It is acknowledged that health literacy is both context- and situation-bound, although more research is needed to improve our understanding of its complexity [50]. Healthcare organisations can improve the health literacy of individuals by making it easy for them to navigate, understand, and use information and services to take care of their health [51].

Overall, the high health literacy found in this study indicates that health communication in the society may have been an effective, influencing factor. Daily information, advice and encouragement were delivered through the media, in relation to the progress of the pandemic, new knowledge about symptoms and complications, and the importance of self-care during isolation, including mental health issues. These interventions may have improved the health literacy of the respondents. They had the characteristics of effective health communication in the

pandemic i.e., to be open and honest about what is known and what is unknown, provide consistent and specific information, and acknowledge emotions which are associated with illness uncertainty such as distress, anxiety and depression which can result in panic and passivity [52]. The managers who were responsible for establishing the outpatient clinic did indeed state that there was no panic [26] which resonates well with the patients' experiences. We therefore suggest that the unusually high proportion of individuals with sufficient health literacy may be explained by the social situation around the first wave of the pandemic. The results may reflect more the participants' specific COVID-19 health literacy rather than their general health literacy as they could answer the questionnaire from the perspective of their situation in the pandemic. It is therefore possible that more specific instruments to measure health literacy are needed in the future when more evidence is available about the contextual factors of health literacy.

The association between sense of security and health literacy was confirmed in this study as was hypothesised and the explanation may be that particular knowledge and skills are required to ensure a sense of security [32]. Research has increasingly been focused on investigating the role health literacy plays in individuals' ability to gain disease-related knowledge and perform sufficient self-care to improve health outcomes [16]. It is possible that the participants with insufficient health literacy had more difficulties communicating with the healthcare professionals who provided the telephone services, for example when asking questions or understanding the information they were given. They may also have had more problems comprehending the information in the media, which during their time of isolation was continually changing, and people's lives were characterised by uncertainty. However, it is also acknowledged that people with sufficient health literacy may have experienced low sense of security and responded against health advice for reasons outside the scope of this study.

Health literacy was associated with educational level, which is in line with previous studies, both in Europe [25], the United States [53] and South-eastern Asia [54]. Controversially, we also found that university-prepared participants had a slightly, but significantly lower sense of security than people with less education which warrants further study. As we speculated earlier, even though sense of security and health literacy were associated, in the exceptional circumstances of the first wave of COVID-19 the more educated people may have realised sooner than others the possible threatening implications of a global pandemic and its effects on them both personally and professionally but also globally for humankind. Consequently, they experienced less sense of security during their isolation. A recent study from Iceland supports this as symptoms of depression and anxiety after a COVID-19 diagnosis were more common among individuals with a higher educational level than among those with a lower educational level [28].

Healthcare services took a great leap during the pandemic with rapid developments within eHealth, and more attention to the significance of health communication and health literacy. The impact of the pandemic on factors such as mental health and social isolation are being studied and this study contributes by adding the concept of sense of security to the map of issues relevant for healthcare professionals to consider when they organise and develop their services. To improve patients' sense of security, healthcare professionals should focus on quality patient-provider communication and develop interventions to improve health literacy because increased levels of health literacy are associated with better decision-making skills, higher levels of empowerment and a more active role in treatment [16,17] which can all contribute to a higher sense of security. To be effective, such interventions should be tailored to people with low literacy level and should address not only knowledge but also interactive and critical skills and present information in appropriate ways [16]. The registered nurses who provided telephone services to the participants in this study described how they attempted to provide comprehensive, holistic care [30] which can be interpreted as an attempt to improve patients' sense of security in general and to

support their health literacy.

The COVID-19 pandemic provided a unique opportunity within healthcare to study how people, most of whom previously were healthy and may not have had much experience of illness or use of healthcare, reacted and coped with the sudden uncertainty of a life-threatening disease. This population-based study was conducted in those exceptional circumstances, and although many became scared and isolated the whole nation was united in tackling the pandemic, avoiding infecting others and protecting vulnerable groups.

The high sense of security and high health literacy among the participants in the study suggests that the public measures taken during the first wave of the pandemic, through person-centred surveillance and continuous information provision, were successful. The results can inform policies and practice in order to make them evidence-based and person-centred, more inclusive and equitable, as has been called for in a recent position paper from the European Association of Communication in Healthcare [55].

The strength of this study lies in the fact that the whole population of people caught in the first wave of COVID-19 in the country were invited to participate, and the response rate of 60% can be regarded as satisfactory. We acknowledge the limitation that the instrument to measure sense of security has not been tested before in this population or setting. The data on both sense of security and health literacy was skewed, which might indicate that those who scored lower were less likely to participate. However, compared with the population [56], the sample is appropriately representative as regards the age and gender and the educational level of the sample, where 40% had a university degree, similar to the population, since 41% of the Icelandic population aged 24–64 had a university degree in 2019 [57]. We further acknowledge that the independent variables of the model explain only about 13% of the variation in sense of security, indicating that there are other factors, beyond the scope of this study, that are associated with sense of security. The complexities of the COVID-19 pandemic and the exceptional circumstances in which this study was conducted make it impossible to generalise the results to another context. Therefore, it is important to study further the relationship between sense of security and health literacy in other populations and context. Finally, information was not available on whether the participants stayed in isolation alone or with others, which might have affected their experience and sense of security.

5. Conclusion

Sense of security was high among individuals who received surveillance from an outpatient clinic during their COVID-19 isolation, and sense of security was associated with health literacy. The high health literacy rate among participants indicates how context-bound health literacy can be but warrants further attention, and more research is needed on the concept of sense of security and its importance as a patient-reported outcome factor in healthcare.

5.1. Practice implications

Healthcare professionals can improve the sense of security of patients through measures to improve their health literacy, including their navigation health literacy, by practising good communication, and providing effective patient education.

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CRedit authorship contribution statement

Brynja Ingadottir: Conceptualisation, Methodology, Investigation,

Writing – original draft, Writing – review & editing, Supervision, Project administration, Funding acquisition. **Bjork Bragadottir:** Writing – original draft, Writing – review & editing. **Sigríður Zoega:** Conceptualisation, Methodology, Investigation, Writing – review & editing, Project administration, Funding acquisition. **Katrin Blondal:** Conceptualisation, Writing – review & editing. **Helga Jonsdottir:** Conceptualisation, Methodology, Writing – review & editing, Project administration, Funding acquisition. **Elin J.G Hafsteinsdottir:** Conceptualisation, Methodology, Investigation, Formal analysis, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

None to declare.

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